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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,594	11/20/2001	Mark A. Livingston	10011693-1	8922

7590 09/07/2004

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EXAMINER

ARNOLD, ADAM

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/988,594

Applicant(s)

LIVINGSTON, MARK A.

Examiner

Adam Arnold

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5 is/are allowed.
- 6) ☒ Claim(s) 6-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/20/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 6-9 and 11-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Westermann. Referring to claim 6, Westermann discloses a method of forming a model of a 3D object (Page 100, col. 2, line 2) comprising generating a 3D set of points (or “voxels”—Page 101, col. 2, line 35); grouping the points into 3D cells (Page 101, col. 1, line 41); subdividing a cell into a plurality of cells (Page 101, col. 1, line 10); locating adjacent cells that contact the subdivision (Page 102, col. 2, line 11); and subdividing the adjacent cell (Page 102, col. 2, line 12) to eliminate dangling points (Page 102, col. 2, line 11—i.e., “hanging nodes”), where only one voxel is added to adjacent cells (Page 102, col. 2, line 7—“inserting a [point at] cubes center”), and where it is unnecessary to subdivide any cells beyond the adjacent cells (in light of the fact that Westermann only discusses subdividing adjacent cells in page 102, first paragraph, the reference teaches it is unnecessary to subdivide any cells beyond the adjacent ones).

Referring to claim 7, the remarks presented above with respect to claim 6 apply equally to this claim.

Referring to claim 8, Westermann discloses grouping the points into cubic cells (Page 101, col. 1, line 10).

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Referring to claim 9, Westermann discloses subdividing the cell forming 8 subdivisions (Page 101, col. 1, line 9).

Referring to claim 11, Westermann discloses where subdividing the adjacent cell is performed automatically (Page 102, col. 2, line 13).

Referring to claim 12, Westermann discloses adding only one point per adjacent cell (i.e., in the center of the adjacent cell--Page 102, col. 2, line 7)

Referring to claim 13, Westermann discloses where the subdividing comprises forming 6 pyramids (Page 102, col. 2, line 8).

Referring to claim 14, the remarks presented above with respect to claim 10 apply equally to this claim.

Referring to claim 15, Westermann discloses removing at least one subdivision from the model (Page 101, col. 1, line 13).

Referring to claim 16, Westermann discloses reproducing at least one of the cells and adding it to the model (Page 102, col. 1, line 7).

Referring to claim 17, Westermann discloses continuing to add subdivisions and cells until a volume defined by the object has been filled (Page 101, col. 2, lines 18-20).

Referring to claim 18, the remarks presented above with respect to claim 6 apply equally to this claim.

Referring to claim 19, the remarks presented above with respect to claim 15 apply equally to this claim.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Westermann.

Westermann does not disclose where the subdividing cell step forms 12 subdivisions.

Westermann does disclose subdividing a cube into 6 pyramids (Page 102, col. 2, line 8). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to subdivide the cell to form 12 subdivisions. One of ordinary skill in the art would have been motivated to do this because if the 6 pyramids were further subdivided, they would form 12 tetrahedra. This would further serve the purpose of generating a finer level of surface detail.

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Westermann in view of Zhou. Westermann does not disclose assigning color values to the set of points. Zhou discloses color for generating the 3D volume (page 139, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to assign color values to the points. One of ordinary skill in the art would have been motivated to do this in order to increase visual clarity in complex 3D shapes.

***Allowable Subject Matter***

6. Claims 1-5 are allowed.

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7. The following is an examiner's statement of reasons for allowance: The prior art does not anticipate, nor does it suggest, the invention as claimed in claims 1-5. The prior art of record does not disclose a user interface for volume sculpting where a processor operates to provide on the display concurrent viewing of both a first view of a sculpting object and a second view of the object, the first view providing a full, six-degree-of-freedom orientation control of the view.

The above indicated limitations, particularly in combination with the other limitations in the respective claims are not anticipated or suggested by the prior art.

#### ***Response to Arguments***

8. Applicant's arguments with respect to claims 1-5 have been considered and are persuasive. Claims 1-5 have been allowed.

Applicant's arguments with respect to claims 6-20 have been considered, but are not persuasive. The applicant contends that Westermann does not teach where the "adjacent cells are subdivided by having only one voxel added to them, and where it is unnecessary to subdivide any cells beyond the adjacent cells." In the rejection above, the examiner points out where one voxel is inserted at the adjacent cells center and the reference teaches only subdividing the adjacent cell. In regard to the applicant's "teaching away" argument, the grounds of the rejection have changed and this argument no longer applies. Finally, the applicant argues that Westermann in view of Zhou does not show subdividing the adjacent cells to eliminate dangling points. As this limitation was dealt with in the claim 6 rejection above, it is unnecessary to reiterate the point.


The rejections to claims 6-20 stand.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam Arnold whose telephone number is 703 305 8413. The examiner can normally be reached on Monday through Friday from 7:30 A.M. to 4:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached on 703 305 9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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